Greater Manchester's Clean Air Plan to tackle Nitrogen Dioxide Exceedances at the Roadside

Note 26: Analysis of Funds

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Authorised by: **Date:**	Ian Palmer 1st November 2019		

COVID-19 Pandemic Statement

This work has not considered the impact of the COVID-19 pandemic. Whilst we are continuing, where possible, to develop the Greater Manchester Clean Air Plan, the pandemic has already had an impact on our ability to keep to the timescales previously indicated and there may be further impacts on timescales as the impact of the pandemic becomes clearer.

We are also mindful of the significant changes that could result from these exceptional times. We know that the transport sector has already been impacted by the pandemic, and government policies to stem its spread. The sector's ability to recover from revenue loss, whilst also being expected to respond to pre-pandemic clean air policy priorities by upgrading to a cleaner fleet, will clearly require further thought and consideration.

The groups most affected by our Clean Air Plan may require different levels of financial assistance than we had anticipated at the time of writing our previous submission to Government.

More broadly, we anticipate that there may be wider traffic and economic impacts that could significantly change the assumptions that sit behind our plans. We have begun to consider the impacts, and have committed to updating the government as the picture becomes clearer over time.

We remain committed to cleaning up Greater Manchester's air. However, given the extraordinary circumstances that will remain for some time, this piece of work remains unfinished until the impact of the COVID-19 pandemic has been fully considered by the Greater Manchester Authorities.

1 Introduction

1.1 Greater Manchester (GM) district authorities have been mandated by the Government to produce a Clean Air Plan (CAP) to set out how they will target and mitigate areas of poor air quality within their boundaries. Arup and AECOM have been commissioned by Transport for Greater Manchester (TfGM) to assess the impact of offering a grant to vehicle owners adversely impacted by the CAP. This technical note aims to outline the methodology and key assumptions incorporated in this assessment. The process of estimating the most effective level of funding, uptake and thus total funding pot required is ongoing and subject to change as further evidence is sourced.

1.2 The analysis produced as part of the information presented herein was part of the overall suite of information used by the GM CAP Project Team to determine the final grant values that were to be approved for usage. Other factors were applied in that process, such as designing the process to avoid outcomes incompatible with other GM strategies and benchmarking against published grant levels used by TfL and other Clean Air Plan cities.

2 Methodology

2.1 The methodology to estimate the most effective grant level offered to vehicles owners impacted by a CAZ was determined using the following steps:

- Estimate a baseline response to CAZ for each mode;
- Develop a way to test the impact of a grant;
- Test various grant amounts to establish a view of the relationship between grant amount and the response to CAZ;
- Develop a grant recommendation for each mode; and
- Estimate the uptake of the recommended grant.

3 Estimate baseline response to CAZ

3.1 Each transport mode or vehicle type was assessed independently and by a method deemed appropriate for its specific characteristics. In some cases, a relatively detailed cost model was developed (HGVs, LGVs and Taxis) while a more simplified cost model or analytical assessment was used in others. The purpose of these assessments was to estimate what response vehicles owners in each vehicle type might have in reaction to a CAZ charge. Several common factors formed the basis of these assessments across all of the vehicle types which included:

- Identifying the options available to become compliant – at a minimum this includes consideration of the option to upgrade to a compliant vehicle of the same type and if a retrofit solution is available and/or feasible.

- Considering the supply and demand of compliant vehicles and other compliant options – Euro 6 vehicles were developed later in some vehicle types than others which means that the demand and supply for these vehicles will vary. An excess of demand relative to supply of compliant vehicles could result in significant market distortion and further negative impacts to businesses with non-compliant vehicles.
- Identifying the cost of new and second-hand compliant vehicles – this is important to estimate the impact of a grant on responses and determine the percentage of upgrade cost any potential grant would cover which provides context and a measure of business impact mitigation.
- Typical vehicle life spans – this can be used to understand the choice a vehicle owner is making when weighing up if they would rather continue to use their non-compliant vehicle and pay the proposed CAZ charge or upgrade to a compliant vehicle.

4 Develop methodology to test grant impact

4.1 To assess the impact of a grant, it was assumed that the grant takes the form of a single payment or cash inflow to the vehicle owner at the time of the cash outflow associated with becoming compliant (i.e. purchase of a compliant vehicle). In the cost models developed for HGVs, LGVs and Taxis, the grant can be applied in this form with a new set of responses generated.

4.2 In the scenario where grants are only offered to those non-compliant vehicles owners that scrap their vehicle (rather than on-selling it) the grant was compared to the estimated value of the non-compliant vehicle and the vehicle owner was assumed to choose the option that was best for them financially.

4.3 An important consideration as part of this section of the analysis was identification of who the grants should/would be offered to. In most cases the grant is assumed to only be available to GM registered vehicle owners while additionally for some vehicle types only vehicles owned by small businesses are eligible.

5 Establish relationship between grant and CAZ response

5.1 Using the cost models and by analysing compliant vehicle prices, vehicle life spans and annual CAZ charges for non-compliant vehicles, a relationship can be established between the level of funding and the percentage of the non-compliant market that is estimated to upgrade. Testing various levels of funding in small but uniform increments allows this relationship to be visualised for each vehicle type. This relationship helps to identify the most valuable/impactful level of funding in terms of achieving a shift towards vehicle owners upgrading relative to the amount of funding offered.

5.2 **Figure 1** show this relationship for the van sector if a CAZ charge of £10 per day was to be implemented in 2023 while **Figure 2** shows this relationship for HGVs for a charge of £60 per day implemented from the end of 2021. **Figure 3** and **Figure 4** provide an indication of how much funding would be required at each level of funding offered. These figures are based on vehicle owners' response to CAZ only and do not include the vehicles owners who would naturally upgrade their vehicle during the period of time that funding is offered. Additionally, two scenarios are shown regarding the eligibility of non-compliant vehicle owners for funding (in addition to being registered in Greater Manchester and being a small business):

1. The existing non-compliant **vehicle can be sold** with the money received then used alongside funding to purchase a compliant vehicle; and
2. The existing non-compliant **vehicle must be scrapped** in order to access funding towards the purchase of a compliant vehicle.

Figure 1 Upgrading percentage by level of funding offered - Vans

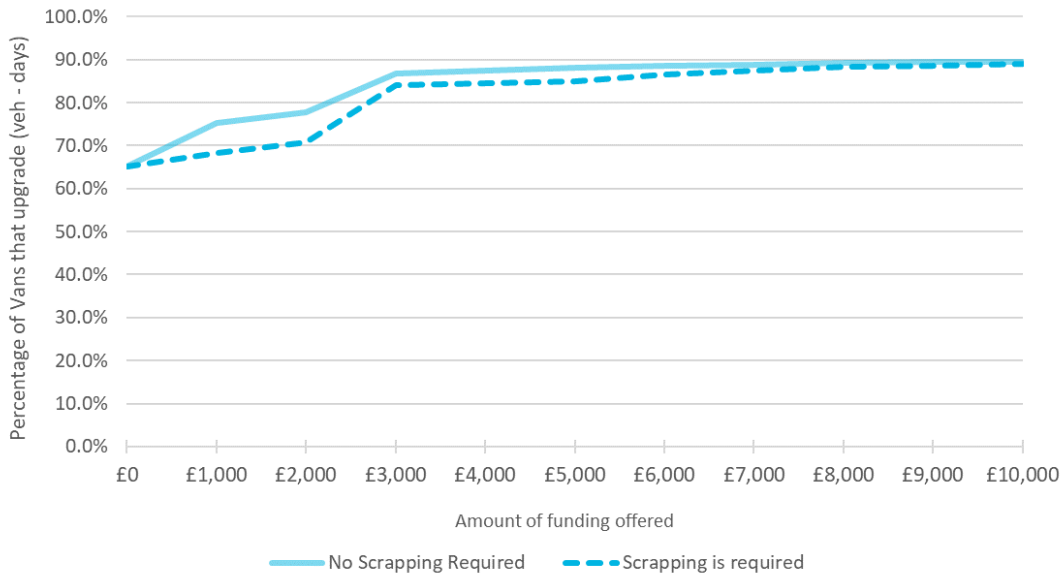
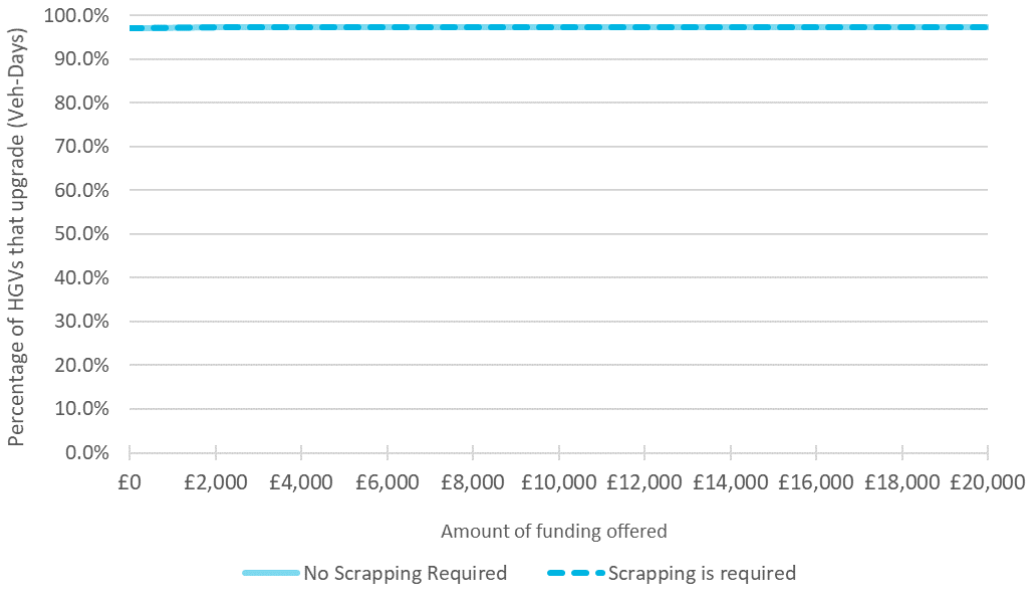


Figure 2 Upgrading percentage by level of funding offered - HGVs

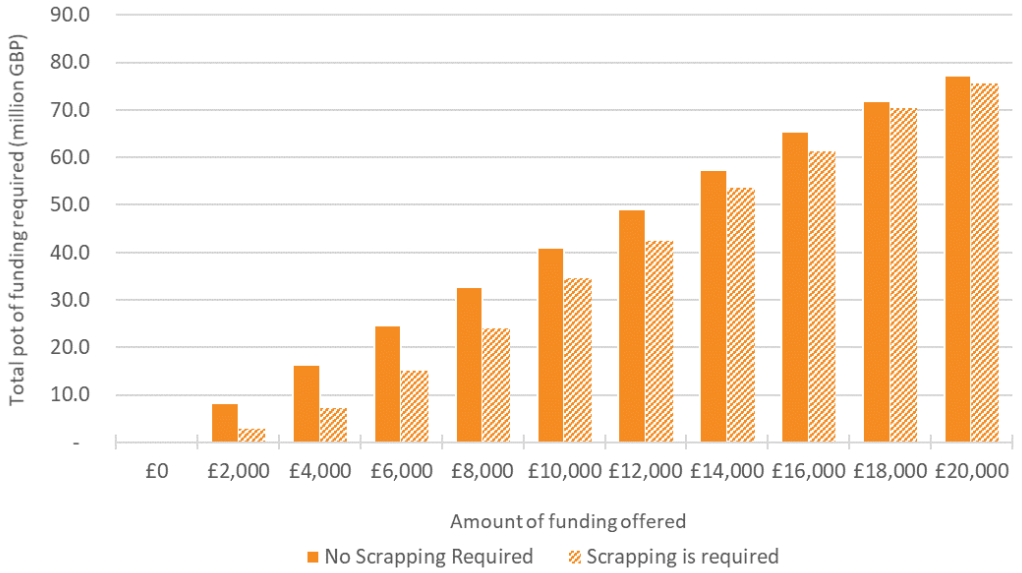


5.3 **Figure 1** shows that funding is estimated to increase the upgrading response of vehicles owners up to a funding amount of approximately £3,000 for both scenarios before the response becomes less sensitive to funding. When scrapping of the non-compliant vehicle is required to access funding, the immediate response reduced however it is estimated to produce approximately the same response (as if scrapping is not required) from a funding offer of £3,000 or more. It is important to note that only GM registered vehicles owned by small businesses are eligible for funding, thus there is a portion of non-compliant vehicles owners represented in the figure above who receive no benefit from funding.

5.4 **Figure 2** illustrates that the proposed charge for HGVs achieves a high rate of compliance on its own and that the funding does not impact vehicle owners' responses.

Figure 3 Total funding pot required for those responding to CAZ - Vans

Figure 4 Total funding pot required for those responding to CAZ - HGVs



5.5 **Figure 3** shows that as the funding offered increases, when scrapping is not required, the total amount of funding required increases relatively linearly after £3,000 (as the number of vehicle owners receiving the funding remains constant). In the scenario where scrapping is required, the number of non-compliant vehicle owners which choose to scrap their car in order to access funding is relatively low for funding offers below £3,000. As the funding offered increases above £3,000, the number of vehicle owners estimated to upgrade remains constant (as demonstrated by **Figure 1**) however the total amount of funding required increases non-linearly as more vehicle owners choose to scrap their vehicle to access funding instead of selling it.

5.6 **Figure 4** shows the estimated total amount of funding required at each level of funding offered (in increments of £2,000). When scrapping of existing non-compliant vehicles is not required the total amount of funding increases linearly given the number of vehicles owners applying for funding is estimated to remain constant. When scrapping non-compliant vehicles is required the number of vehicle owners estimated to apply for funding is significantly reduced for lower levels of funding.

6 Recommended grant level

6.1 The information outlined in the previous section which is purely model derived, was issued to the GM CAP Project Team and was then used along with a variety of other factors to inform the recommended level of funding for each vehicle type as part of the formal GM CAP ask of government. These wider factors included:

- the impact on encouraging non-compliant vehicle owners to upgrade to compliant vehicles;
- the ability to mitigate negative impacts to business – grants were compared to purchase prices of new and used compliant vehicles;
- the process in which the grant could be offered / implemented and how it can be targeted (e.g. administration burdens of over complex schemes, how scrap values would naturally preclude some groups from finding the scheme attractive);
- Exemptions to certain vehicle categories (e.g. wheel chair accessible taxis, charity sector minibuses, etc.); and
- Varying options to becoming compliant and associated additional benefits (e.g. electric vehicles, retrofit etc.)

6.2 Following this process, the recommended grant levels defined by the GM CAP Project Team were set for each vehicle type, and are outlined below:

- **LGVs:** £3,500
    - Additional hardship fund of £1,500 (not modelled)
- **HGVs:** Varies depending on gross weight
    - 7.5t = £2,500
    - 18t = £3,500
    - 26t = £4,500
    - 32t = £5,500
    - 44t = £4,500
- **Taxis:** Varies depending on response and vehicle type
    - Wheel chair accessible vehicles (WAV) exempt until 2023
    - Zero emission vehicle = £10,000

    - Retrofit = £5,000
- **Private Hire vehicles:** £3,000 (representing £4,000 for zero emission and £2,000 for other compliant options)
- **Minibuses:** Depending on vehicle type
    - WAV or zero emission = £10,000
    - All others = £5,000
- **Coaches:** £16,500
- **Buses:** £16,500

6.3 For those vehicles where the cost model approach could directly accept the grant level and produce a quantified additional behavioural beyond the CAZ charges, the values above were applied into the modelling of the option for consultation, to predict the overall impact of the GM CAP on compliance with NO_2 concentration standards.

7 Estimate grant uptake

7.1 To estimate the grant uptake and response to a CAZ with the recommended level of funding, the cost models were used where available. These models produce the number of non-compliant vehicle owners that are estimated to upgrade and, from them, the number that are estimated to apply for funding. Where cost models are not available, the uptake of funds is calculated based on estimated upgrade rates, fleet age mixes and a comparison between funding offered and non-compliant vehicle value estimates.

7.2 These estimates are based on vehicle owner's response to a CAZ, meaning that they do not take into account the vehicles that would be naturally upgraded over the period of time that funding is available. In reality, if it is known that funding will be available to upgrade vehicles, vehicle owners may tailor their vehicle upgrading schedule to benefit from the scheme which may further inflate the number that upgrade during this period. These factors are considered where possible when estimating the final number of vehicles that are estimated to apply for funding and thus the total amount of funding that is required.